Table 340A

Designated Beneficial Uses
Willamette Basin
(340-041-0340)

Beneficial Uses	Willamette River Tributaries						Main Stem Willamette River			
	Clackamas River	Molalla River	Santiam River	McKenzie River	Tualatin River	All Other Streams & Tributaries	Mouth to Willamette Falls, Including Multnomah Channel	Willamette Falls to Newberg	Newberg to Salem	Salem to Coast Fork
Public Domestic Water Supply[1]	X	X	X	X	X	X	X	X	X	X
Private Domestic Water Supply[1]	X	X	X	X	X	X	X	X	X	X
Industrial Water Supply	X	X	X	X	X	X	X	X	X	X
Irrigation	X	X	X	X	X	X	X	X	X	X
Livestock Watering	X	X	X	X	X	X	X	X	X	X
Fish & Aquatic Life[2]	X	X	X	X	X	X	X	X	X	X
Wildlife & Hunting	X	X	X	X	X	X	X	X	X	X
Fishing	X	X	X	X	X	X	X	X	X	X
Boating	X	X	X	X	X	X	X	X	X	X
Water Contact Recreation	X	X	X	X	X	X	X	X[3]	X	X
Aesthetic Quality	X	X	X	X	X	X	X	X	X	X
Hydro Power	X	X	X	X	X	X	X	X		
Commercial Navigation & Transportation							X	X	X	

[1] With adequate pretreatment and natural quality that meets drinking water standards.
[2] See also Figures 340A and 340B for fish use designations for this basin.
[3] Not to conflict with commercial activities in Portland Harbor.

Table produced November, 2003

Figure 340A: Fish Use Designations*
Willamette Basin, Oregon

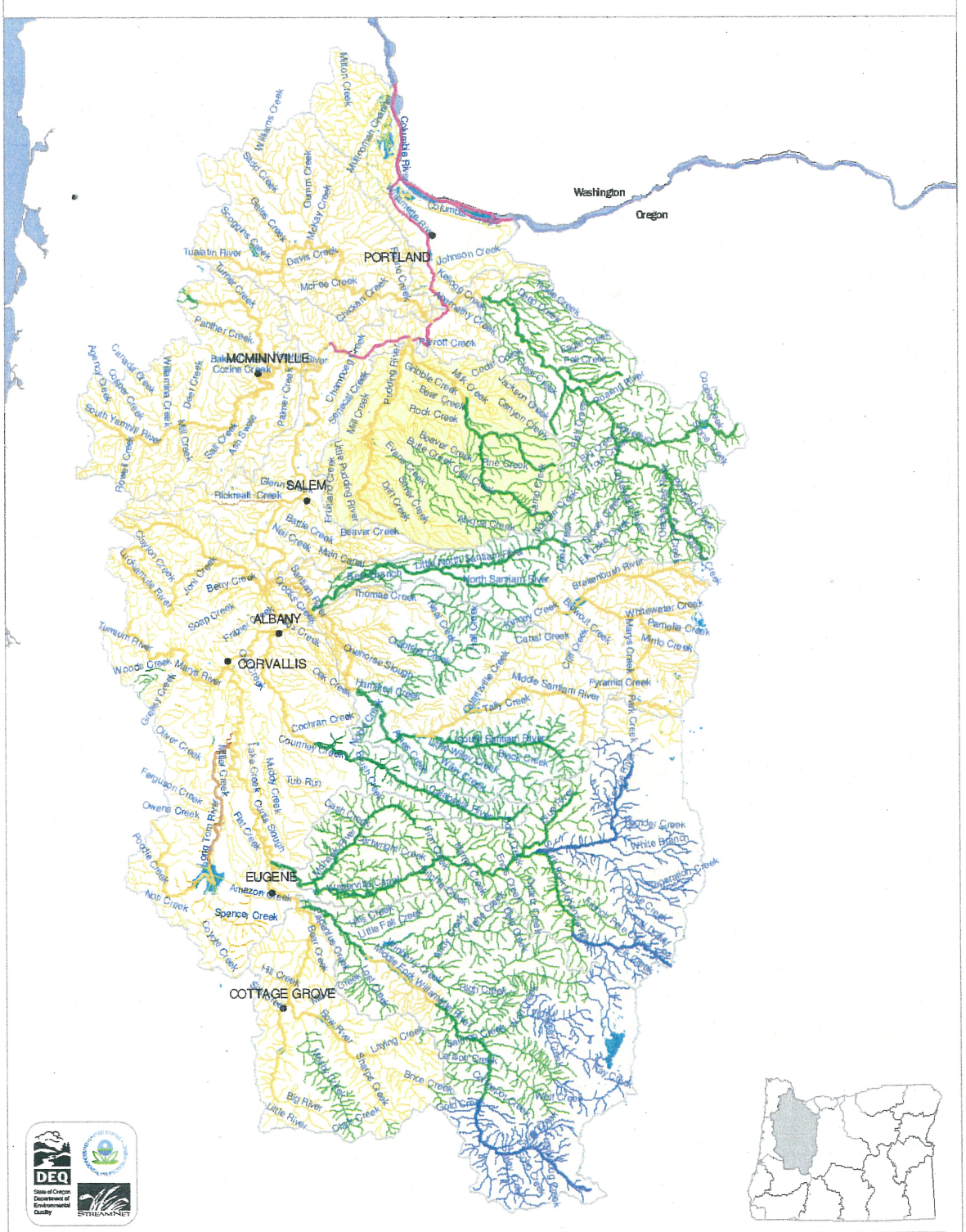
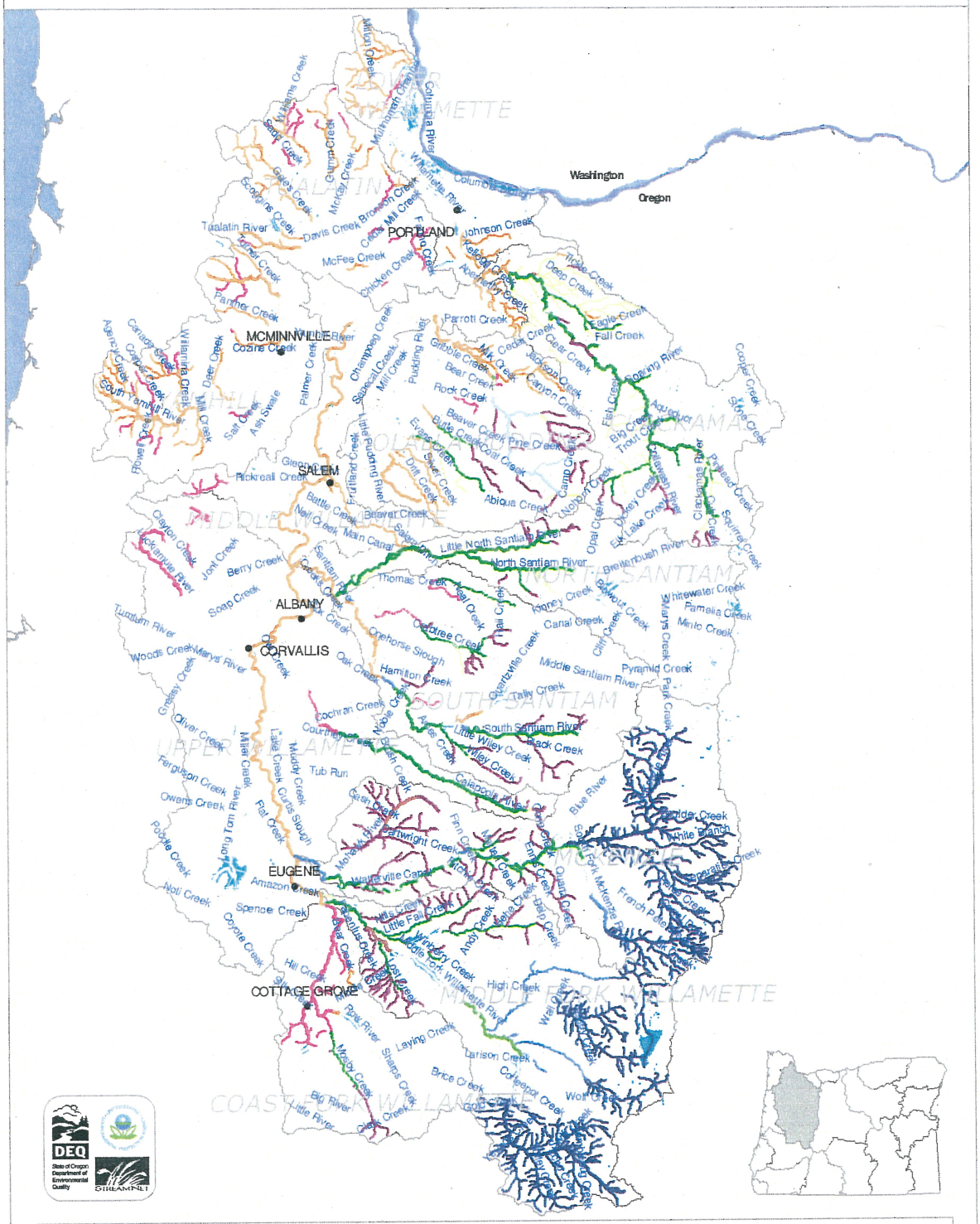

Washington
Oregon
PORTLAND
MCMINNVILLE
SALEM
ALBANY
CORVALLIS
EUGENE
COTTAGE GROVE
Columbia River
Willamette River
Tualatin River
Yamhill River
Pudding River
Molalla River
Clackamas River
North Santiam River
South Santiam River
Middle Santiam River
Calapooia River
Long Tom River
Mary's River
Luckiamute River
Marion Creek
Johnson Creek
Tryon Creek
Fanno Creek
Rock Creek
Beaver Creek
Mill Creek
Thomas Creek
Cochran Creek
Courtney Creek
Tub Run
Amazon Creek
Spencer Creek
Hill Creek
Row River
Little River
Big River
Laying Creek
Brice Creek
Gold Creek
Lafever Creek
Sharpe Creek
Little Fall Creek
Middle Fork Willamette River
Big Creek
Bear Creek
Fall Creek
Lake Creek
Mosby Creek
Flat Creek
Oak Creek
Hamilton Creek
Quartzville Creek
Tally Creek
Canal Creek
Pyramid Creek
Mary's Creek
Mimo Creek
Parrella Creek
Whitewater Creek
Breitenbush River
Little North Santiam River
Thomas Creek
Berry Creek
Soap Creek
Frazier Creek
Oak Creek
Owens Creek
Ferguson Creek
Oliver Creek
Greenleaf Creek
Turnburn River
Woods Creek
Mary's River
Luckiamute River
Rickreall Creek
Glenn Creek
Battle Creek
Neal Creek
Beaver Creek
Main Canal
Santiam River
Crooks Creek
Frolander Creek
Little Pudding River
Drift Creek
Senecal Creek
Mill Creek
Pudding River
Gribble Creek
Bear Creek
Rock Creek
Beaver Creek
Butte Creek
Evanger Creek
Silver Creek
Pine Creek
Milk Creek
Jackson Creek
Canyon Creek
Cedar Creek
Fall Creek
Molalla River
Abiqua Creek
Pudding River
Mill Creek
Salt Creek
Ash Swale
Deer Creek
Williams Creek
Panther Creek
Turner Creek
Davis Creek
McFee Creek
Chicken Creek
Chehalem Creek
Parrott Creek
Cozine Creek
Baker Creek
Chehalem Creek
Panther Creek
Dairy Creek
Gales Creek
Scoggins Creek
Rock Creek
Dairy Creek
Gales Creek
Milton Creek
Multnomah Creek
Williams Creek
Sucker Creek
Gumm Creek
McKay Creek
Scoggins Creek
Tualatin River
Turner Creek
Canada Creek
Copper Creek
South Yamhill River
Powell Creek
Mill Creek
Salt Creek
Ash Swale
Deer Creek
Williams Creek
Paine Creek
Chehalem Creek
Senecal Creek
Mill Creek
Pudding River
Little Pudding River
Frolander Creek
Drift Creek
Silver Creek
Evanger Creek
Butte Creek
Beaver Creek
Rock Creek
Bear Creek
Gribble

Figure 340B: Salmon and Steelhead Spawning Use Designations*
Willamette Basin, Oregon


Washington
Oregon
PORTLAND
MCMINNVILLE
SALEM
ALBANY
CORVALLIS
EUGENE
COTTAGE GROVE
Columbia River
Willamette River
Tualatin River
Yamhill River
Pudding River
Molalla River
Clackamas River
Sandy River
Santiam River
Little North Santiam River
North Santiam River
Middle Santiam River
South Santiam River
Calapooia River
Long Tom River
Marys River
Luckiamute River
Rickreall Creek
Mill Creek
Abiqua Creek
Thomas Creek
Oak Creek
Amazon Creek
Coast Fork Willamette River
Middle Fork Willamette River
Little Fall Creek
Fall Creek
Eagle Creek
Clear Creek
Rock Creek
Beaver Creek
Pine Creek
Coal Creek
Silver Creek
Drift Creek
Butte Creek
Bear Creek
Canyon Creek
Parrott Creek
Deep Creek
Tickle Creek
Johnson Creek
McFee Creek
Chicken Creek
Dairy Creek
Panther Creek
Palmer Creek
Champoeg Creek
Senecal Creek
Mill Creek
Little Pudding River
Ferrelland Creek
Bottle Creek
Neff Creek
Main Canal
Beaver Creek
Berry Creek
Soap Creek
Jory Creek
Clayton Creek
Tumtum River
Woods Creek
Oliver Creek
Ferguson Creek
Owens Creek
Potlatch Creek
Noti Creek
Spence Creek
Coyote Creek
Hill Creek
Shady Creek
Row River
Mosby Creek
Big River
Little River
Laying Creek
Sharps Creek
Larison Creek
Brice Creek
Coleman Creek
Wolf Creek
High Creek
Winberry Creek
Little Fall Creek
Amazon Creek
Spencer Creek
Flat Creek
Curtis Slough
Muddy Creek
Tub Run
Lake Creek
Miller Creek
Long Tom River
Marys River
Oak Creek
Hamilton Creek
Crabtree Creek
Crooked Creek
Cochran Creek
Courtney Creek
Little Wiley Creek
Wiley Creek
Calapooia River
Quartzville Creek
Tally Creek
Middle Santiam River
Pyramid Creek
Canal Creek
Cliff Creek
Marys Creek
Mintic Creek
Pamelia Creek
Whitewater Creek
Breitenbush River
Elk Lake Creek
Oak Creek
Oak Creek
Santiam Creek
Thomas Creek
Hail Creek
Abiqua Creek
Butte Creek
Silver Creek
Drift Creek
Pine Creek
Coal Creek
Beaver Creek
Rock Creek
Bear Creek
Canyon Creek
Clear Creek
Fall Creek
Eagle Creek
Deep Creek
Tickle Creek
Johnson Creek
Parrott Creek
Mill Creek
Gribble Creek
Pudding River
Champoeg Creek
Senecal Creek
Mill Creek
Palmer Creek
Panther Creek
Dairy Creek
McFee Creek
Chicken Creek
Tualatin River
Scoggins Creek
Gales Creek
Dairy Creek
Rock Creek
Beaver Creek
Pine Creek
Coal Creek
Silver Creek
Drift Creek
Butte Creek
Abiqua Creek
Little Pudding River
Ferrelland Creek
Bottle Creek
Neff Creek
Main Canal
Beaver Creek
Berry Creek
Soap Creek
Jory Creek
Clayton Creek
Luckiamute River
Tumtum River
Woods Creek
Oliver Creek
Ferguson Creek
Owens Creek
Potlatch Creek
Noti Creek
Spence Creek
Coyote Creek
Hill Creek
Shady Creek
Row River
Mosby Creek
Big River
Little River
Laying Creek
Sharps Creek
Larison Creek
Brice Creek
Coleman Creek
Wolf Creek
High Creek
Winberry Creek
Little Fall Creek
Amazon Creek
Spencer Creek
Flat Creek
Curtis Slough
Muddy Creek
Tub Run
Lake Creek
Miller Creek
Long Tom River
Marys River
Oak Creek
Hamilton Creek
Crabtree Creek
Crooked Creek
Cochran Creek
Courtney Creek
Little Wiley Creek
Wiley Creek
Calapooia River
Quartzville Creek
Tally Creek
Middle Santiam River
Pyramid Creek
Canal Creek
Cliff Creek
Marys Creek
Mintic Creek
Pamelia Creek
Whitewater Creek
Breitenbush River
Elk Lake

DILUTION RULE EVALUATION (OAR 340-041-0007)

HUBBARD WASTEWATER TREATMENT PLANT

City of Hubbard, Oregon

EXISTING CONDITIONS ANALYSIS

	MILL CREEK FLOW [1]		WWTP EFFLUENT FLOW [2]		WWTP BOD_5 [2]		Dilution Rule Evaluation[3]		
	7Q10 Low Flow (cfs)	7Q10 Low Flow (mgd)	Monthly Average (mgd)	Monthly Maximum (mgd)	Monthly Average (mg/l)	Monthly Maximum (mg/l)	Dilution Rule Allowable Discharge (mgd)	Weekly Average / Allowable Flow (%)	Monthly Average / Allowable Flow (%)
May	4.78	3.09	0.18	0.19	3.7	6.3	0.49	37%	38%
June	2.39	1.54	0.15	0.20	3.6	7.9	0.20	76%	100%
July	2.39	1.54	0.14	0.20	4.9	15.1	0.10	140%	195%
August	2.39	1.54	0.15	0.18	3.0	5.5	0.28	53%	62%
September	2.39	1.54	0.14	0.17	3.3	4.2	0.37	38%	46%
October	4.78	3.09	0.13	0.16	2.7	3.9	0.79	17%	21%

NOTES FOR EXISTING CONDITIONS ANALYSIS:

(1) Mill Creek monthly minimum low is Mill Creek 7Q10 low flow for June through September, and 200% of 7Q10 low flow for May and October.

(2) WWTP effluent flow and BOD_5 based on 2002-04 Hubbard WWTP Discharge Monitoring Reports (DMRs).

(3) Dilution Rule Evaulation based on Max. Month BOD_5 (mg/l) divided by Mill Creek 7Q10 low flow (mgd) less than one.

FUTURE CONDITIONS ANALYSIS [4]

	MILL CREEK FLOW [5]		WWTP EFFLUENT FLOW [6][7]		WWTP BOD_5 [8]		Dilution Rule Evaluation[9]		
	7Q10 Low Flow (cfs)	7Q10 Low Flow (mgd)	Monthly Average (mgd)	Monthly Maximum (mgd)	Projected Monthly Avg (mg/l)	Projected Monthly Max (mg/l)	Dilution Rule Allowable Discharge (mgd)	Monthly Average / Allowable Flow (%)	Monthly Maximum / Allowable Flow (%)
May	4.78	3.09	0.26	0.27	5.0	7.0	0.44	59%	61%
June	2.39	1.54	0.21	0.28	5.0	7.0	0.22	97%	128%
July	2.39	1.54	0.21	0.29	5.0	7.0	0.22	93%	130%
August	2.39	1.54	0.22	0.25	5.0	7.0	0.22	98%	114%
September	2.39	1.54	0.20	0.24	5.0	7.0	0.22	91%	110%
October	4.78	3.09	0.19	0.23	5.0	7.0	0.44	43%	53%

NOTES FOR FUTURE CONDITIONS ANALYSIS:

(4) Future conditions analysis for Design Year 2025, which is design basis for the 2005 Hubbard WWTP Improvements Project.

(5) Mill Creek monthly minimum low is Mill Creek 7Q10 low flow for June through September, and 200% of 7Q10 low flow for May and October.

*(6) WWTP monthly average effluent flow = Exist. Monthly Avg. Flow * 2004-2025 increase in AAF from 2004 Hubbard WWTP PreDesign Report.*

*(7) WWTP monthly maximum effluent flow = Exist. Monthly Max. Flow * 2004-2025 increase in MMDWF from 2004 Hubbard WWTP PreDesign Report.*

(8) Projected Monthly Max WWTP BOD_5 based on NPDES discharge limit for Summer Season.

(9) Dilution Rule allowable discharge based on Monthly Average BOD_5 (mg/l) divided by Mill Creek 7Q10 low flow (mgd).

TEMPERATURE STANDARD EVALUATION (OAR 340-041-0028)

HUBBARD WASTEWATER TREATMENT PLANT

City of Hubbard, Oregon

EXISTING CONDITIONS ANALYSIS

	MILL CREEK FLOW [1]		WWTP EFFLUENT FLOW [2]		WWTP EFFLUENT TEMP [2]		Temperature Standard Evaluation [3]		
	7Q10 Low Flow (cfs)	7Q10 Low Flow (mgd)	Weekly Maximum (mgd)	Monthly Maximum (mgd)	Monthly Average (ºC)	Monthly Maximum (ºC)	Allowable Discharge (mgd)	Weekly Average / Allowable Flow (%)	Monthly Average / Allowable Flow (%)
May	4.78	3.09	0.18	0.19	18.1	21.0	0.26	69%	72%
June	2.39	1.54	0.15	0.20	20.1	22.0	0.10	149%	196%
July	2.39	1.54	0.14	0.20	21.2	24.1	0.06	238%	333%
August	2.39	1.54	0.15	0.18	22.9	31.0	0.03	500%	583%
September	2.39	1.54	0.14	0.17	20.1	23.0	0.08	175%	210%
October	4.78	3.09	0.13	0.16	20.2	22.0	0.19	70%	86%

NOTES FOR EXISTING CONDITIONS ANALYSIS:

(1) Mill Creek monthly minimum low is Mill Creek 7Q10 low flow for June through September, and 200% of 7Q10 low flow for May and October.

(2) WWTP effluent flow and temperature based on 2002-04 Hubbard WWTP Discharge Monitoring Reports (DMRs).

(3) Temperature Standard allowable discharge based on Mill Creek Biological Criteria (18ºC), 0.30ºC allowable temp increase in MZ and weekly max temperature.

FUTURE CONDITIONS ANALYSIS [4]

	MILL CREEK FLOW [5]		WWTP EFFLUENT FLOW [6][7]		WWTP EFFLUENT TEMP [8]		Temperature Standard Evaluation [9]		
	7Q10 Low Flow (cfs)	7Q10 Low Flow (mgd)	Weekly Maximum (mgd)	Monthly Maximum (mgd)	Monthly Average (ºC)	Monthly Maximum (ºC)	Allowable Discharge (mgd)	Weekly Average / Allowable Flow (%)	Monthly Average / Allowable Flow (%)
May	4.78	3.09	0.26	0.27	18.1	21.0	0.26	100%	103%
June	2.39	1.54	0.21	0.28	20.1	22.0	0.10	215%	282%
July	2.39	1.54	0.21	0.29	21.2	24.1	0.06	343%	480%
August	2.39	1.54	0.22	0.25	22.9	31.0	0.03	720%	840%
September	2.39	1.54	0.20	0.24	20.1	23.0	0.08	252%	302%
October	4.78	3.09	0.19	0.23	20.2	22.0	0.19	99%	122%

NOTES FOR FUTURE CONDITIONS ANALYSIS:

(4) Future conditions analysis for Design Year 2025, which is design basis for the 2005 Hubbard WWTP Improvements Project.

(5) Mill Creek monthly minimum low is Mill Creek 7Q10 low flow for June through September, and 200% of 7Q10 low flow for May and October.

*(6) WWTP monthly average effluent flow = Exist. Monthly Avg. Flow * 2004-2025 increase in AAF from 2004 Hubbard WWTP PreDesign Report.*

*(7) WWTP monthly maximum effluent flow = Exist. Monthly Max. Flow * 2004-2025 increase in MMDWF from 2004 Hubbard WWTP PreDesign Report.*

(8) WWTP monthly average and maximum effluent temperature based on 2002-04 Hubbard WWTP Discharge Monitoring Reports (DMRs).

(9) Temperature Standard allowable discharge based on Mill Creek Biological Criteria (18ºC), 0.30ºC allowable temp increase in MZ and weekly max temperature.

CONCEPTUAL ENGINEER'S OPINION OF PROBABLE COST **KENNEDY/JENKS CONSULTANTS**

Project: Hubbard WWTP Alternate Discharge Study **Prepared By:** PLVM

Alternate: New Pudding River Outfall **Date Prepared:** December-05

K/J Proj #: 0491011*00 **ENR CCI** 7646.87 (Dec 2005)

Item	Description	Quantity	Units	Unit Price	Amount
CAPITAL IMPROVEMENTS					
PUMP STATION					
1	PCC Pump Station Wet Well	1	Lump Sum	$15,000	$15,000
2	Submersible Pumps (20 HP) & Appurtenances	2	Each	$18,500	$37,000
3	Pump Station Valves & Piping	1	Lump Sum	$10,000	$10,000
4	Gated Bypass Channel (2 Slide Gates)	1	Lump Sum	$15,000	$15,000
5	Connect to Exist. 8" C900 PVC FM	2	Each	$1,000	$2,000
5	WWTP Site Preparation/Restoration	1	Lump Sum	$10,000	$10,000
6	Electrical & Controls	1	Lump Sum	$8,900	$8,900
FORCE MAIN					
7	6" C900 PVC Force Main (Granular BF)	16,400	Lin.Ft.	$60	$984,000
8	6" C900 PVC Fittings	1	Lump Sum	$25,000	$25,000
9	Air Release Valves	2	Each	$5,000	$10,000
10	FM Site Preparation/Restoration	1	Lump Sum	$50,000	$50,000
OUTFALL					
11	6" HDPE Force Main (HDD Installation)	100	Lin.Ft.	$1,500	$150,000
12	Outfall Site Preparation/Restoration	1	Lump Sum	$50,000	$50,000
	Subtotal: Materials & Installation				$1,366,900
	Plus: Contractor Mobilization, O&P 15%				$205,035
	Subtotal: Construction				$1,571,935
	Plus: Engr/Survey/Legal/Administrative 25%				$392,984
	Subtotal: Design & Construction				$1,964,919
	Plus: Contingency 25%				$491,230
TOTAL CAPITAL COST					**$2,460,000**
OPERATIONS & MAINTENANCE					
13	Annual Maintenance	1	Lump Sum	$25,000.00	$25,000
14	Pumping (20 hp pump for 5 months)	53640	kWh	$0.06	$3,218
15	Labor (4 hrs/week for 5 months)	80	Hours	$45	$3,600
ANNUAL OPERATIONS & MAINTENANCE COST					$31,818
TOTAL OPERATIONS & MAINTENANCE COST (20-year Net Present Worth @ 4%)					**$430,000**
PERMITTING					
16	Environmental & Permitting	1	Lump Sum	$100,000	$100,000
17	Right-of-Way/Easement Acquisition	1	Lump Sum	$15,000	$15,000
TOTAL PERMITTING					**$120,000**
TOTAL ESTIMATED ALTERNATIVE COST					**$3,010,000**

CONCEPTUAL ENGINEER'S OPINION OF PROBABLE COST **KENNEDY/JENKS CONSULTANTS**

Project: Hubbard WWTP Alternate Discharge Study **Prepared By:** PLVM

Alternate: Subsurface Discharge Outfall **Date Prepared:** December-05

K/J Proj #: 0491011*00 **ENR CCI** 7646.87 (Dec 2005)

Item	Description	Quantity	Units	Unit Price	Amount
CAPITAL IMPROVEMENTS					
TREATMENT PLANT IMPROVEMENTS					
1	Upgrade UV Facility	1	Lump sum	$60,000	$60,000
PUMP STATION					
1	PCC Pump Station Wet Well	1	Lump Sum	$15,000	$15,000
2	Submersible Pumps (5 HP) & Appurtenances	2	Each	$15,000	$30,000
3	Pump Station Valves & Piping	1	Lump Sum	$7,500	$7,500
4	Gated Bypass Channel (2 Slide Gates)	1	Lump Sum	$15,000	$15,000
5	Connect to Exist. 8" C900 PVC FM	2	Each	$1,000	$2,000
6	WWTP Site Preparation/Restoration	1	Lump Sum	$10,000	$10,000
7	Electrical & Controls	1	Lump Sum	$13,950	$13,950
FORCE MAIN					
8	6" C900 PVC Force Main	2,000	Lin.Ft.	$50	$100,000
9	FM Site Preparation/Restoration	1	Lump Sum	$5,000	$5,000
RAPID INFILTRATION BASINS					
10	Gated Control Structure	1	Each	$15,000	$15,000
11	Basin Excavation	14,500	Cu.Yds.	$7	$101,500
12	Seeding	3	Acres	$800	$2,400
13	Irrigation System	2	Each	$7,500	$15,000
14	Monitoring Wells	3	Each	$12,500	$37,500
15	RI Site Preparation/Restoration	1	Lump Sum	$20,000	$20,000
	Subtotal: Materials & Installation				$449,850
	Plus: Contractor Mobilization, O&P 15%				$67,478
	Subtotal: Construction				$517,328
	Plus: Engr/Survey/Legal/Administrative 25%				$129,332
	Subtotal: Design & Construction				$1,163,987
	Plus: Contingency 35%				$407,395
TOTAL CAPITAL COST					**$1,570,000**
OPERATIONS & MAINTENANCE					
16	Annual Maintenance	1	Lump Sum	$25,000.00	$25,000
17	Energy (5 hp pump for 5 months)	13320	kWh	$0.06	$799
18	City Labor (12 hrs/week for 5 months)	240	Hours	$45	$10,800
19	Quarterly GW Monitoring & Annual Report	1	Lump Sum	$7,500	$7,500
ANNUAL OPERATIONS & MAINTENANCE COST					$44,100
TOTAL OPERATIONS & MAINTENANCE COST (20-year Net Present Worth @ 4%)					**$600,000**
PERMITTING					
19	Environmental & Permitting	1	Lump Sum	$150,000	$150,000
20	Land Acquisition	1	Acre	$75,000	$75,000
TOTAL PERMITTING					**$230,000**
TOTAL ESTIMATED ALTERNATIVE COST					**$2,400,000**

HubbardAlternateCosts_Dec05

CONCEPTUAL ENGINEER'S OPINION OF PROBABLE COST **KENNEDY/JENKS CONSULTANTS**

Project: Hubbard WWTP Alternate Discharge Study **Prepared By:** PLVM

Alternate: Reclaimed Water Agricultural Irrigation **Date Prepared:** December-05

K/J Proj #: 0491011*00 **ENR CCI** 7646.87 (Dec 2005)

Item	Description	Quantity	Units	Unit Price	Amount
CAPITAL IMPROVEMENTS					
PUMP STATION					
1	PCC Pump Station Wet Well	1	Lump Sum	$15,000	$15,000
2	Submersible Pumps (10 HP) & Appurtenances	2	Each	$20,000	$40,000
3	Pump Station Valves & Piping	1	Lump Sum	$5,000	$5,000
4	Gated Bypass Channel (2 Slide Gates)	1	Lump Sum	$15,000	$15,000
5	Connect to Exist. 8" C900 PVC FM	2	Each	$1,000	$2,000
6	Electrical & Controls	1	Lump Sum	$7,700	$7,700
FORCE MAIN					
7	6" C900 PVC Force Main (Granular BF)	5,500	Lin.Ft.	$50	$275,000
8	6" C900 PVC Fittings	1	Lump Sum	$2,500	$2,500
9	Air Release Valves	1	Each	$5,000	$5,000
9	Allowance: Site Preparation/Restoration	1	Lump Sum	$10,000	$10,000
RECLAIMED WATER HOLDING POND					
10	Basin Excavation	1,100	Cu.Yds.	$7	$7,700
11	Embankment	500	Cu.Yds.	$8	$4,000
12	HDPE Liner & Geotextile Fabric	20,000	Sq.Ft.	$5	$100,000
13	HDPE Liner Anchor Trench	560	Lin.Ft.	$25	$14,000
14	Allowance: Site Preparation/Restoration	1	Lump Sum	$5,000	$5,000
	Subtotal: Materials & Installation				$507,900
	Plus: Contractor Mobilization, O&P 15%				$76,185
	Subtotal: Construction				$584,085
	Plus: Engr/Survey/Legal/Administrative 25%				$146,021
	Subtotal: Design & Construction				$1,314,191
	Plus: Contingency 25%				$328,548
TOTAL CAPITAL COST					**$1,640,000**
OPERATIONS & MAINTENANCE					
15	Annual Maintenance	1	Lump Sum	$10,000.00	$10,000
16	Energy (10 hp pump for 5 months)	27,000	kWh	$0.06	$1,620
17	City Labor (6 hrs/week for 5 months)	120	Hours	$45	$5,400
ANNUAL OPERATIONS & MAINTENANCE COST					$17,000
TOTAL OPERATIONS & MAINTENANCE COST (20-year Net Present Worth @ 4%)					**$230,000**
PERMITTING					
18	Environmental & Permitting	1	Lump Sum	$60,000	$60,000
TOTAL PERMITTING					**$60,000**
TOTAL ESTIMATED ALTERNATIVE COST					**$1,930,000**

CONCEPTUAL ENGINEER'S OPINION OF PROBABLE COST **KENNEDY/JENKS CONSULTANTS**

Project: Hubbard WWTP Alternate Discharge Study **Prepared By:** PLVM

Alternate: Mechanical Cooling of WWTP Effluent **Date Prepared:** December-05

K/J Proj #: 0491011*00 **ENR CCI** 7646.87 (Dec 2005)

Item	Description	Quantity	Units	Unit Price	Amount
CAPITAL IMPROVEMENTS					
TREATMENT PLANT IMPROVEMENTS					
1	Chiller (100 Ton Cooling Capacity)	2	Each	$80,000	$160,000
2	Piping, Valves & Misc.	1	Lump Sum	$40,000	$40,000
3	Chiller Return Pump and Piping	1	Lump Sum	$25,000	$25,000
4	Gated Bypass Channel (2 Slide Gates)	1	Lump Sum	$12,500	$12,500
5	Connect & Extend Exist. 8" C900 PVC FM	1	Lump Sum	$5,000	$5,000
6	Upgrade Standby Generator	1	Lump Sum	$50,000	$50,000
7	Site Work	1	Lump Sum	$15,000	$15,000
8	Electrical & Controls	1	Lump Sum	$29,250	$29,250
	Subtotal: Materials & Installation				$336,750
	Plus: Contractor Mobilization, O&P 15%				$50,513
	Subtotal: Construction				$387,263
	Plus: Engr/Survey/Legal/Administrative 25%				$96,816
	Subtotal: Design & Construction				$871,341
	Plus: Contingency 25%				$217,835
TOTAL CAPITAL COST					**$1,090,000**
OPERATIONS & MAINTENANCE					
9	Annual Maintenance	1	Lump Sum	$15,000.00	$15,000
10	Energy (250 kW for 5 months)	900,000	kWh	$0.06	$54,000
11	City Labor (6 hrs/week for 5 months)	120	Hours	$45	$5,400
ANNUAL OPERATIONS & MAINTENANCE COST					$74,400
TOTAL OPERATIONS & MAINTENANCE COST (20-year Net Present Worth @ 4%)					**$1,010,000**
PERMITTING					
12	Environmental & Permitting	1	Lump Sum	$25,000	$25,000
TOTAL PERMITTING					**$25,000**
TOTAL ESTIMATED ALTERNATIVE COST					**$2,130,000**